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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,939	02/19/2004	Chang-Kyu Lee	P-0647	1926

34610 7590 03/20/2006

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EXAMINER	
EWART, JAMES D	
ART UNIT	**PAPER NUMBER**
2683	

DATE MAILED: 03/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/780,939	LEE, CHANG-KYU	
	Examiner	Art Unit	
	James D. Ewart	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *amendment dated 21 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27,29 and 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *24-27* is/are allowed.

6)☒ Claim(s) *1-6,8-23 and 29* is/are rejected.

7)☒ Claim(s) *7 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments filed 21 February 2006, have been fully considered by Examiner, but they are not deemed persuasive. Applicant argues that Savusalo does not teach malfunctioning of an antenna. The Savusalo reference is used to show an abnormal current consumption of a power amplifier that amplifies a transmission signal and to detect a fault. Although Savusalo teaches that the fault occurs in the amplifier, it is well known that an abnormal condition could be related to the antenna and it is well known to isolate a fault automatically. The Examiner has provided the Fritzmann et al. reference to show the teaching of determining a malfunctioning antenna as well as the switching to a backup antenna. The combined teaching of both Savusalo and Fritzmann et al. meets the claimed invention.

2. Regarding the informality objection to claim 1, Applicant's amendment has overcome the objection and the Examiner withdraws the objection.

3. Regarding the 35 USC § 112 rejection of claim 10, Applicant's amendment has overcome the rejection and the Examiner withdraws the objection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

> to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1,5,6,9,10,14,15,17,18,19,21,22 and 23 are rejected under 35 USC 103(a) as being unpatentable over Fritzmann et al. in view of Savusalo (PCT/FI91/00180).

Referring to claim 1, Fritzmann et al. teaches an apparatus for monitoring an antenna of a mobile station (Column 3, Lines 16-19) comprising: a voltage evaluator that constantly monitors a voltage on an antenna connection (Column 3, Lines 17-18) that senses an antenna malfunction when the monitored voltage is out of range (Column 3, Lines 16-22) and a communication band switch to selectively switch the transmission signal from the first antenna to the second antenna when the first antenna is (Column 1, Lines 6-12 and Column 5, Lines 42-44), but does not teach the monitoring comprises: a current sensing circuit to sense a current consumption amount of a power amplifier that amplifies a transmission signal; a baseband chip to determine a malfunctioning of a first device based on the sensed current, the baseband chip to control switching to a second device when it is determined that the first device is malfunctioning. Savusalo teaches the monitoring comprises: a current sensing circuit to sense a current consumption amount of a power amplifier (Figure 1; R1, CNA1 and LNA1) that amplifies a transmission signal (Figure 1; 3); a baseband chip (Figure 1; 10) to determine a malfunctioning of a first device based on the sensed current (Page 4, Lines 1-11), the baseband chip to control switching to a second device when it is determined that the first device is malfunctioning (Page 4, Lines 11-14). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Fritzmann et al. with the teaching of Savusalo wherein the monitoring comprises: a current sensing circuit to sense a current

consumption amount of a power amplifier that amplifies a transmission signal; a baseband chip to determine a malfunctioning of a first device based on the sensed current, the baseband chip to control switching to a second device when it is determined that the first device is malfunctioning to provide failure detection (Page 1, Line 5). Because the output of a differential amplifier with DC input is baseband and this feeds to the control chip (10), Examiner equates the control chip with the baseband chip.

Referring to claim 5, Savusalo further teaches wherein the baseband chip determines malfunction when the sensed current increases (Page 4, Lines 1-12). An increased current would indicate increased power consumption of the amplifier and by increasing the current too much, abnormal operating conditions of the amplifier would be detected by the control chip via the differential amplifier and the control chip would detect a malfunction.

Referring to claim 6, Savusalo further teaches if an increased amount of current is not within a tolerance range for determining a normal state of the amplifier a malfunction is determined (Page 4, Lines 1-14).

Referring to claim 9, Fritzmann et al further teaches wherein the first antenna comprises an external antenna (Column 3, Lines 61-62).

Referring to claim 10, Fritzmann et al further teaches wherein the second antenna comprises an external antenna (Column 3, Lines 61-62).

Referring to claim 14 Fritzmann et al. teaches an apparatus for monitoring an antenna of a mobile station (Column 3, Lines 16-19) comprising: a voltage evaluator that constantly monitors a voltage on an antenna connection (Column 3, Lines 17-18) that senses an antenna malfunction when the monitored voltage is out of range (Column 3, Lines 16-22) and switching to a preliminary antenna if the sensed amount of current does not come within the allowance range (Column 1, Lines 6-12 and Column 5, Lines 42-44), but does not teach the monitoring comprises: sensing a consumed amount of current of a power amplifier; checking whether the sensed amount of current is acceptable for determining a normal state; and switching to a preliminary antenna if the sensed amount of current is out of range of normal operating condition. Savusalo teaches the monitoring comprises: sensing a consumed amount of current of a power amplifier (Figure 1; 10); checking whether the sensed amount of current is acceptable for determining a normal state (Page 4, Lines 1-14); and switching to a preliminary antenna if the sensed amount of current is out of range of normal operating condition (Page 4, Lines 1-14). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of 14 Fritzmann et al. with the teaching of Savusalo teaches the monitoring comprises: sensing a consumed amount of current of a power amplifier; checking whether the sensed amount of current is acceptable for determining a normal state; and switching to a preliminary antenna if the sensed amount of current is out of range of normal operating condition to control switching to a second device when it is determined that the first device is malfunctioning (Page 4, Lines 11-14).

Referring to claim 15, Savusalo further teaches wherein the sensing comprises: measuring a dropped amount of voltage due to the resister provided between a battery voltage terminal and a power source voltage terminal of the power amplifier (Figure 1); and generating a voltage level corresponding to the measured dropped amount of voltage (Page 4, Lines 10-11).

Referring to claim 17, Savusalo further teaches wherein the generated voltage level has an acceptable range of normal operating condition of the amplifier but does not teach indicating a range with an average value of the range plus or minus a value. Examiner takes official notice that it is well known to indicate a range with an average value of the range plus or minus a value. Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the teaching of Fritzmann et al. and Savusalo of indicating a range with an average value of the range plus or minus a value to determine whether the amplifier is operating normally or not.

Referring to claim 18, Fritzmann et al. and Savusalo teach the limitations of claim 18 but do not teach determining the normal operating conditions of a device by testing and measuring normal operating conditions of the device. Examiner takes official notice that it is well known to determine the normal operating conditions of a device by testing and measuring normal operating conditions of the device. Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the teaching of Fritzmann et al. and Savusalo with determine the normal operating conditions of a device by testing and

measuring normal operating conditions of the device to determine when the device is not functioning and to switch to the redundant device.

Referring to claim 19, Fritzmann et al. further teaches wherein the switching comprising: switching a transmission path to the preliminary antenna when the sensed amount of current does not come within the allowance range and the preliminary antenna is normally operated (Column 5, Lines 33-44).

Referring to claim 21, Fritzmann et al. further teaches maintaining the current transmission path if the sensed amount of current comes within the allowance range (Column 5, Lines 33-44).

Referring to claim 22, Fritzmann et al. further teaches wherein the preliminary antenna comprises another antenna that is not currently connected to the transmission path (Figure 2).

Referring to claim 23, Fritzmann et al. further teaches wherein said another antenna includes one of an auxiliary antenna external antenna protruded outwardly from the mobile station and an provided inside the mobile station (Column 1, Lines 38-42).

Referring to claim 25, Fritzmann et al. teaches the limitations of claim 25, but does not teach a circuit to sense current consumption of an amplifier; and a chip to determine the state of the first antenna based on the sensed current. Savusalo teaches a circuit to sense current

consumption of an amplifier (Figure 1; CNA1 and LNA1); and a chip to determine the state of the first antenna based on the sensed current (Figure 1;10 and Page 4, Lines 1-11). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Fritzmann et al. with the teaching of Savusalo teaches a circuit to sense current consumption of an amplifier; and a chip to determine the state of the first antenna based on the sensed current to control switching to a second device when it is determined that the first device is malfunctioning (Page 4, Lines 11-14)

Referring to claim 26, Fritzmann et al. teaches wherein the second device switches to operation of the second antenna when the first antenna is determined to be malfunctioning (Column 1, Lines 6-12 and Column 5, Lines 42-44).

5. Claims 2 and 20 are rejected under 35 USC 103(a) as being unpatentable over Fritzmann et al. and Savusalo and further in view of Kitahashi (U.S. Patent No. 6,690,366).

Referring to claims 2 and 20, Fritzmann et al. and Savusalo teach the limitations of claims 2 and 20, but do not teach wherein the baseband chip further informs a user of the malfunction. Kitahashi teaches wherein the baseband chip further informs a user of the malfunction (Column 2, Lines 37-43 and Figures 1 & 6). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Fritzmann et al. and Savusalo with the teaching of Kitahashi wherein the baseband chip

further informs a user of the malfunction to notify the user of the operational status of the apparatus (Column 2, Lines 28-34).

6. Claims 3,4 and 16 are rejected under 35 USC 103(a) as being unpatentable over Fritzmann et al. and Savusalo and further in view of Hosokawa (U.S. Patent 5,903,422).

Referring to claim 3, Savusalo further teaches wherein the current sensing circuit comprises: a resistor coupled between a node 'A' and a node 'B' the node 'A' coupled to battery voltage terminal (Figure 1) and the node 'B' coupled to a power source voltage terminal of the a power amplifier (Figure 1), the resistor to sense the current consumption amount of the power amplifier (Page 4, Lines 1-14); and a differential amplifier to output a voltage level corresponding to a voltage difference between a voltage of the node 'A' and a voltage of the node 'B' (Figure 1), but does not teach the current sensing circuit is a comparator. Hosokawa teaches the current sensing circuit is a comparator (Figure 3 and Column 2, Lines 59-65). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Fritzmann et al. and Savusalo with the teaching of Hosokawa wherein the current sensing circuit is a comparator to provide an overcurrent sensing circuit (Column 2, Lines 43-44).

Referring to claim 4, Hosokawa further teaches wherein the voltage of the node 'A' is input to a non-inverted input terminal of the comparator and the voltage of the node 'B' is input to an inverted input terminal of the comparator (Figure 3).

Referring to claim 16, Savusalo further teaches wherein the current sensing circuit comprises: a resistor coupled between a node 'A' and a node 'B' the node 'A' coupled to battery voltage terminal (Figure 1) and the node 'B' coupled to a power source voltage terminal of the a power amplifier (Figure 1), the resistor to sense the current consumption amount of the power amplifier (Page 4, Lines 1-14); and a differential amplifier to output a voltage level corresponding to a voltage difference between a voltage of the node 'A' and a voltage of the node 'B' (Figure 1), but does not teach the current sensing circuit is a comparator and the current flows from the non-inverted input to the inverted input. Hosokawa teaches the current sensing circuit is a comparator and the current flows from the non-inverted input to the inverted input (Figure 3 and Column 2, Lines 59-65). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Fritzmann et al. and Savusalo with the teaching of Hosokawa wherein the current sensing circuit is a comparator and the current flows from the non-inverted input to the inverted input to provide an overcurrent sensing circuit (Column 2, Lines 43-44).

7. Claims 11, 12 and 29 are rejected under 35 USC 103(a) as being unpatentable over Fritzmann et al. in view of Savusalo and further in view of Hosokawa (U.S. Patent No. 6,437,577) .

Referring to claim 11, Fritzmann et al. teaches an apparatus for monitoring an antenna of a mobile station (Column 3, Lines 16-19) comprising: a voltage evaluator that constantly monitors a voltage on an antenna connection (Column 3, Lines 17-18) that senses an antenna malfunction when the monitored voltage is out of range (Column 3, Lines 16-22), but does not

teach wherein monitoring comprises: a resister coupled between a battery voltage terminal and a power source voltage terminal of a power amplifier to sense a current consumption amount of the power amplifier; a voltage detector to detect a voltage level corresponding to an amount of voltage drop due to the resister; and a baseband chip to determine that a device connected to a current transmission path is in an electrically malfunction state based on the detected voltage level. Savusalo teaches wherein the monitoring comprises: a resister coupled between a battery voltage terminal and a power source voltage terminal of a power amplifier to sense a current consumption amount of the power amplifier (Figure 1; CNA1, R1 and LNA1); a voltage detector to detect a voltage level corresponding to an amount of voltage drop due to the resister (Page 4, Lines 1-11); and a baseband chip to determine that a device connected to a current transmission path is in an electrically malfunction state based on the detected voltage level (Page 4, Lines 1-11). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Fritzmann et al. with the teaching of Savusalo wherein the monitoring comprises: a resister coupled between a battery voltage terminal and a power source voltage terminal of a power amplifier to sense a current consumption amount of the power amplifier; a voltage detector to detect a voltage level corresponding to an amount of voltage drop due to the resister; and a baseband chip to determine that a device connected to a current transmission path is in an electrically malfunction state based on the detected voltage level to control switching to a second device when it is determined that the first device is malfunctioning (Page 4, Lines 11-14). Fritzmann et al. and Savusalo teach the limitations of claim 11, but do not teach that the voltage detector is a comparator. Hosokawa teaches that the voltage detector is a comparator (Figure 3 and Column 2, Lines 59-65). Therefore at the time the

invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Fritzmann et al. and Savusalo with the teaching of Hosokawa wherein the voltage detector is a comparator to provide an overcurrent sensing circuit (Column 2, Lines 43-44). Because the output of a differential amplifier with DC input is baseband and this feeds to the control chip (10), Examiner equates the control chip with the baseband chip.

Referring to claim 12, Fritzmann et al. further teaches wherein if the antenna is determined to be in a malfunction state, the baseband chip generates a switching control signal to switch the current transmission path to a preliminary antenna (Column 1, Lines 6-12, Column 5, lines 36-38 and Column 6, Lines 53-60). The voltage measured by the voltage evaluator is DC i.e. baseband.

Referring to claim 29, Fritzmann et al. teaches determining that the antenna is in the electrically malfunctioning state and Savusalo teaches detecting abnormal amplifier conditions based on an increased voltage level (Page 4, Lines 1-7).

8. Claim 13 is rejected under 35 USC 103(a) as being unpatentable over Fritzmann et al., Savusalo and Hosokawa and further in view of Kitahashi .

Referring to claim 13, Fritzmann et al.,Savusalo and Hosokawa teach the limitations of claim 13, but do not teach the baseband chip informs a user of an abnormal operation. Kitahashi teaches wherein the baseband chip informs a user of an abnormal operation (Column 2, Lines 37-

43 and Figures 1 & 6). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Fritzmann et al. and Savusalo with the teaching of Kitahashi wherein the baseband chip informs a user of an abnormal operation to notify the user of the operational status of the apparatus (Column 2, Lines 28-34)

Allowable Subject Matter

9. Claims 7 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reason for allowable subject matter is provided below:

Referring to claim 7, the references sited do not teach wherein the communication band switch comprises: a diplexer to separate first signals and second signals by low pass filtering and high pass filtering; a first switch to transmit and receive the first signals according to a band switching control signal input to a band switching control terminal; a second switch to transmit and receive the second signals according to the band switching control signal; and a third switch to switch the power-amplified transmission signal received from a duplexer to one of the first antenna and the second antenna based on a switching control signal of the baseband chip.

Referring to claim 30, the references sited do not teach

10. Claims 24-27 are allowed. The reason is the same as for claim 7.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James D. Ewart whose telephone number is (571) 272-7864. The examiner can normally be reached on M-F 7am - 4pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (571)272-7872. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-2600.

Ewart
March 10, 2006

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